

DOCUMENT RESUME

ED 183 423

SE 030 423

AUTHOR Buller, Dave: And Others
 TITLE Health Activities Project (HAP): Heart Fitness and Action Module.
 INSTITUTION California Univ., Berkeley. Lawrence Hall of Science.
 SPONS AGENCY Robert Wood Johnson Foundation, New Brunswick, N.J.
 PUB DATE 79
 NOTE 38p.: For related documents, see SE 030 421-426: Not available in paper copy due to copyright restrictions
 AVAILABLE FROM Hubbard Scientific, P.O. Box 104, Northbrook, IL 60062 (no price quoted)
 EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
 DESCRIPTORS *Classroom Materials: Elementary School Science: Elementary Secondary Education: Health Activities: *Health Education: *Human Body: Junior High Schools: *Science Activities: Science Education: Worksheets

ABSTRACT

Contained within this Health Activities Project (HAP) learning packet are activities for children in grades 5-8. Design of the activities centers around the idea that students can control their own health and safety. Within the Heart Fitness and Action Module are teacher and student folios describing five activities which involve students in exploring heartbeats, pulse rate, pulse recovery after exercise, and in evaluating their physical condition by monitoring pulse recovery. Another activity involves students in training for one week to improve their grip strength. (CS)

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HAP HEALTH ACTIVITIES PROJECT

HEART FITNESS AND ACTION MODULE

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Folios Included in This Module

WHAT'S HAPPENING? This is a teacher's information folio describing the contents and use of the program.

Exploring Heartbeats. The students use stethoscopes to locate their hearts and to listen to their heartbeats. They discover how various body positions affect the heartbeat rate.

Exploring Pulse. Each student locates her pulse points, measures her pulse, and compares her pulse rate to her heartbeat rate.

Pulse Recovery. After exercising, the students monitor the recovery of their pulse rates from the increased rate during exercise to their resting rates.

Shape Up. By monitoring their pulse recovery during a period of physical conditioning, the students discover that training can improve physical condition and pulse recovery time.

Grip Strength. After determining the strength of their grips, the students train for one week to improve their grip strength.

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SE 030 423

Developed by
Lawrence Hall of Science
University of California
Berkeley, CA 94720

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WHAT'S HAPpening?

TEACHER'S
INFORMATION
FOLIO

WHAT IS HAP?

The Health Activities Project (HAP) primarily involves fifth- to eighth-grade students with their own health and safety through hands-on, discovery-approach activities. By investigating their own bodies, the students learn firsthand how their bodies function and what they can do. Most importantly, the students discover that *they* can make changes in the way their bodies perform. HAP's main purpose is to make students more aware of the control they have over their own health and safety.

Is there any order to the HAP activities?

The activities fall under four categories or areas of emphasis. We call these categories **modules**. HAP activities may be used independently, but work best when used in sequence within the module framework. Activities that *must* be conducted in a certain sequence contain the appropriate directions in their "Setting Up" sections.

SIGHT AND SOUND Module

Mask Relay. The students play bounce-ball relay with and without vision-restricting masks and compare the results.

Field of Vision. Each student measures his total field of vision and compares it to the area in which he can see clearly enough to read.

Animal Masks. By wearing vision-modifying masks that simulate the fields of vision of different animals, the students discover how different fields of vision necessitate different kinds of behavior.

Pinhole Viewer. The students find out how the amount of light and type of lens affect images produced by a pinhole viewer.

Look, Listen, and Find. By playing two games in which they must rely on nonverbal communication, the students compare the usefulness of sight signals and sound signals.

Where Are You? The students test their ability to pinpoint the location of sound sources and discover one advantage of having two ears.

ACTION/REACTION Module

Reaction Time. The students time and compare their own reactions to light, sound, and touch stimuli.



Improving Reaction Time. The students explore the effect of a training program on their reaction times when they respond to a light stimulus. This activity introduces the students to systematic collection and analysis of data.

Let's Manipulate. By dropping pieces into matching holes, the students practice their eye / hand coordination and discover that practice can improve their performance.



HEART FITNESS AND ACTION Module

Exploring Heartbeats. The students use stethoscopes to locate their hearts and to listen to their heartbeats. They discover how various body positions affect the heartbeat rate.

Exploring Pulse. Each student locates her pulse points, measures her pulse, and compares her pulse rate to her heartbeat rate.

Pulse Recovery. After exercising, the students monitor the recovery of their pulse rates from the increased rate during exercise to their resting rates.

Shape Up. By monitoring their pulse recovery during a period of physical conditioning, the students discover that training can improve physical condition and pulse recovery time.

Grip Strength. After determining the strength of their grips, the students train for one week to improve their grip strength.

BREATHING FITNESS Module

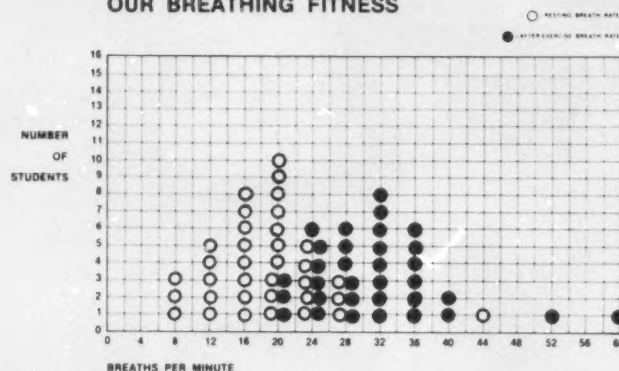
Exploring Breath Rates. After learning how to measure their breathing rates, the students investigate the effects of breathing style, breath holding, and exercise on breath rate.

Breath Recovery. The students monitor the recovery of their breath rates after sprinting and after jogging and compare the results.

Breath Control. The students measure and practice improving their breath control.

Measuring Lung Volume. The students measure their maximum lung volumes and investigate the relationship between lung volume and height.

OUR BREATHING FITNESS



How do you lead a HAP activity? Your role as a HAP teacher is that of a facilitator (one who sets the stage) of learning rather than that of a purveyor of facts. Through many classroom trials we have found that, in many situations, discovery through student activity is more successful than spoon-fed knowledge. The procedure that we recommend you follow is to quickly introduce the activity, demonstrate any special procedures and equipment, and present the students with the challenge or task. Most of the allotted time should be reserved for *student* exploration. Each activity is designed to let your students learn through their own explorations. Follow the activity with questions and discussions that reinforce the students' experience with the ideas and concepts introduced in the activity.

What do you do while the students participate in the activity? While your students work, you have the opportunity to move about the room and spend your time with individuals or small groups. You can participate, lend assistance when it is needed, help students record results, or ask questions that stimulate further activity.

Be flexible. Sometimes your students may become involved in explorations or ask questions that do not lead in the direction you have planned. When this happens, be flexible. These situations can serve as interesting points of departure and often spur further exploration and learning on the part of the students.

How do you lead the discussions? The discussion at the end of the activity is an opportunity for the students to compare discoveries, review the class results, voice their opinions, and share their experiences. Avoid monopolizing the discussion; act rather as a catalyst for discussion.

THE FOLIOS

Thoroughly acquaint yourself with the contents of the activity folio before attempting to lead the activity. Each folio is laid out in a similar format so that you can quickly locate the information you need in each activity.

OVERVIEW

The Overview provides you with a capsule description of the activity.

HEALTH BACKGROUND

This section not only provides you with background information on specific health concepts, but also outlines the activity's general health significance. *Do not read this section to the students!*

MATERIALS

All materials for each activity are listed here. Materials to be provided by the teacher are marked with an asterisk. Such materials include easily obtainable equipment and duplicated Student Sheets. All other equipment is provided in the kit.



SETTING UP

This section outlines the activity's time and advance-preparation requirements. Whenever possible, have your students assist you with the preparation.

THE ACTIVITY

Suggestions on introducing the activity, demonstrating any procedures and equipment, and carrying out the activity are found in this section.



This logo indicates parts of the activity in which the students are actively involved in their explorations.

Analyzing the Data

The questions in this section are designed to help students compare discoveries and results and to interpret the results of the activity.

HEALTH APPLICATIONS

This section contains situational questions that are designed to "bring home" the health or safety significance of the activity. HAP recommends that you wait a day or two after finishing the activity before initiating these discussions.

HAP SIDETRIPS

These additional challenges may be used to extend the scope of the activity for the whole group or for interested students.



This symbol keys you to "Take-Home Ideas": activity-related exercises that the students can take home.



In some cases, the last HAP Sidetrip suggests an activity in which parents and children can participate during an "Open House" night at school.

THE INSERTS

Equipment Cards, Technique Cards, and duplicator masters of the Student Sheets for this module are contained in the module packet. You may wish to insert these sheets into the appropriate folios. The duplicator masters are provided for your use in making photocopies or

your own spirit masters. Do not write on the masters. Use them only for your reference and for the copies you make for the students.

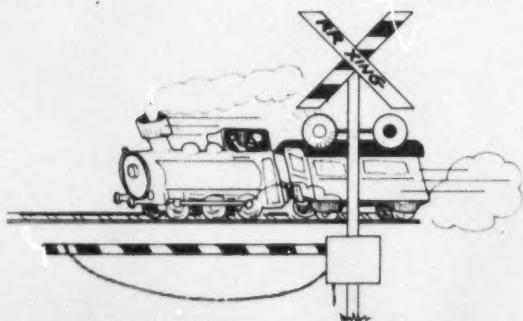
HINTS

Over the years we have discovered some general approaches that improve the flow of learning in the experiential science approach employed by HAP. You probably know and use some of these techniques already, but for those of you who are unfamiliar with the experiential approach, we mention some techniques here.

1. **Equipment.** Make sure that all of the required equipment is present. Do not assume that equipment is in the box.
2. **Preparation.** Check the "Setting Up" section of the folio to find out what you have to do *before* the activity. For instance, in *Reaction Time* the batteries must be installed and the timers checked before you conduct the activity.

- **Charts.** Before posting HAP charts for your class, make sure that all data (adhesive dots, crayon markings) from previous classes have been removed.

3. **Distributing the Materials.** Do not distribute the materials until you have finished the introduction and any demonstrations, and the students have been primed with a challenge and are ready to begin. If distributed earlier, equipment often diverts the students' attention from any instructions you may still have to give.



4. **Interaction.** Hands-on, discovery-approach activities generate a great deal of student-to-student verbal interaction. While participating in HAP activities, children often spontaneously exchange observations and ideas, so be prepared for higher than normal noise levels. This activity-oriented peer interaction is a valuable part of the learning process in HAP activities, so don't discourage it. You should, of course, keep the noise level reasonable (i.e., the children don't have to shout).

WE WANT TO HEAR FROM YOU



These HAP activities have been through both local and national trials with over 2,000 children in regular classrooms. Even so, we know that you will have contributions to make to the Publisher, and we encourage you to do so. Any suggestions on format, equipment, and procedures are extremely important to future revisions. Please submit your ideas to: Dr. Roy Gromme, HAP Project Coordinator, Hubbard, P.O. Box 104, Northbrook, Illinois 60062.

HEALTH ACTIVITIES PROJECT STAFF

Director: Watson M. Laetsch

Co-Directors: Robert C. Knott and Herbert D. Thier

Project Coordinator: Jennifer Meux White

Trials Coordinator: Jack Fishleder

Authors: Dave Buller, Lynne Carter, Sandra Gipsman, Mark Jacobson, Rhona Lee, and Livingston Schneider

Editor: Kay Fairwell

Art Director: Lisa Haderlie Baker

Contributors to the Project: Tony Calica, Mauri Gould, Marcia Linn, Marshall Montgomery, George Moynihan, and Ann Norberg

Health Activities Project
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University of California, Berkeley
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EXPLORING HEARTBEATS

HEART FITNESS AND ACTION Module



OVERVIEW

The students learn to use the stethoscope by locating their hearts and listening to their heartbeats. They discover how sitting, lying down, and standing affect the heartbeat rate.

HEALTH BACKGROUND

A strong heart is essential to a healthy body. The heart is a muscle that contracts and relaxes about 100,000 times a day. The heart valves open and then slam shut, creating a pumping action. By pumping blood throughout the body, the heart sends food and oxygen to the tissues and removes wastes such as carbon dioxide.

The opening and closing of the heart valves produces a distinctive "lub-dub" sound, which can be heard with a stethoscope held near the heart. The heart is usually located slightly to the left of the center of the chest, above the sternum (rib junction) and between the lungs. A stethoscope held against the chest at this location usually produces the best results. The stethoscope picks up the lub-dub sound of the heart valves and carries it to the ears.

Familiarity with the stethoscope and the periodic sounds and contractions of the heart should enhance the students' understanding of heart location and action. This activity also prepares the students for the pulse activities that follow.

MATERIALS

For each student:

- 1 copy of each Student Sheet: EH 1* and EH 2*

For the class:

- 14 stethoscopes
- 1 HAP clock
- 1 C-cell battery
- 1 Disinfectant Kit
- 1 human-body chart
- 15 orange dots
- masking tape*
- paper*

- 1 "Disinfecting the Equipment" Technique Card duplicator masters of Student Sheets EH 1 and EH 2

*Provided by the teacher.

SETTING UP

Suggested Time:

- Plan for 20 minutes for Part One.
- Plan for 40 minutes for Part Two.

Preparing for the Activity

1. The day before the activity, tell the students to wear clothing suitable for lying on the floor.
2. Set up a Wiping Station according to the directions on the "Disinfecting the Equipment" Technique Card.
3. Insert the C-cell battery into the back of the HAP clock. Set the clock in full view of the students.
4. Post the human-body chart.
5. Duplicate Student Sheets.

THE ACTIVITY: PART ONE

Introducing the Activity

1. Show the students a stethoscope, and tell them what it is called. (You might want to inform the students that "stetho" means *chest* and "scope" means *to view*.)
2. Tell the students that they will use stethoscopes to listen to the sound of their heartbeats, a sound they could not hear very well without a stethoscope.

Demonstrating the Proper Use of the Stethoscope

1. Thoroughly wipe each earpiece with a piece of paper towel moistened with the dilute bleach disinfectant.
 - Explain that the earpieces should be cleaned before each student places them in his ears.

Name _____

WORKING WITH THE STETHOSCOPE

Each time you use the stethoscope, clean the earpieces with a paper towel moistened with dilute bleach solution.

PART ONE: FINDING SOUNDS

- Using the stethoscope, listen for sounds in different places around the room.
 - Try to detect sounds that you can't easily hear with just your ears.
- Record the places where you listen and the sounds that you hear.
- Are the sounds loud or soft?

PLACE	WHAT SOUND DID YOU HEAR?	WAS IT LOUD OR SOFT?
1.		
2.		
3.		

PART TWO: FINDING HEARTBEATS

- Exchange Student Sheets with your partner.
- Find the spot on your partner's body where you hear the strongest heartbeat.
- Mark that spot with an X on the human-body drawing on this page.
- What is your partner's heartbeat rate? Find your partner's 30-second heartbeat rate and multiply it by 2 to find the number of beats per minute.

NUMBER OF BEATS IN 30 SECONDS	x 2	NUMBER OF BEATS = PER MINUTE
	x 2 =	

- Describe your partner's heartbeat.

- Can you hear any sounds from the heart other than the lub-dub sound?

What do they sound like?



Name _____

COUNTING HEARTBEATS

PART ONE

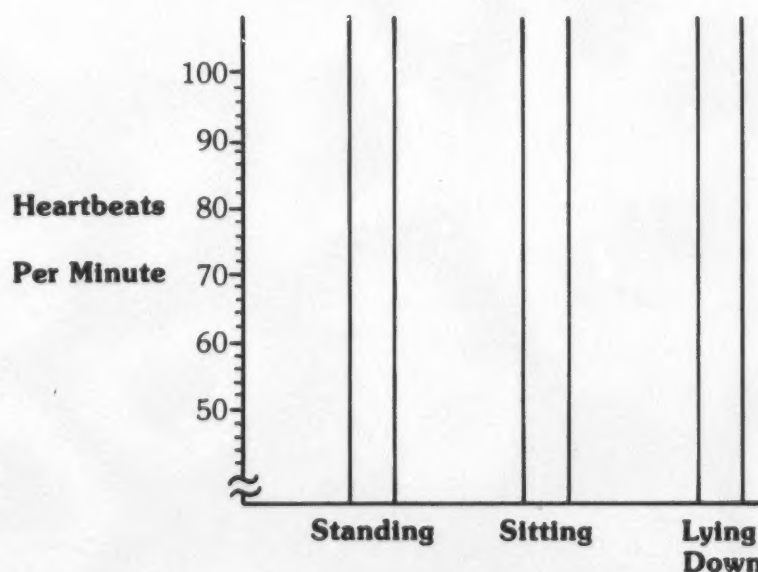
1. Have your partner count your heartbeats for 30 seconds while you are standing, sitting, and then lying down.
2. YOU MUST WAIT ONE FULL MINUTE IN EACH POSITION BEFORE YOUR PARTNER COUNTS YOUR HEARTBEATS.
3. Record the information your partner gives you for your own heartbeat rates in the chart below.

POSITION	NUMBER OF BEATS IN 30 SECONDS	x 2	= NUMBER OF BEATS PER MINUTE
Standing		x 2	=
Sitting		x 2	=
Lying Down		x 2	=

4. Multiply each of the 30-second rates by 2 to find the number of heartbeats per minute.

PART TWO

1. Compare your heartbeat rates by filling in the bar graph below.
2. Fill in the bar space for each position. Each bar should go up to the number of heartbeats per minute recorded for that position.



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HEALTH ACTIVITIES PROJECT



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2. Face away from the class to demonstrate the proper way to wear a stethoscope.

- The earpiece with the flexible tube is always placed in the right ear. (The earpieces then point slightly forward, matching the ear canals.)
- Caution the students against banging or pressing on the diaphragm (black disk) when someone is wearing the stethoscope. Such actions could damage the ears of the listener.



Exploring with the Stethoscope

1. Distribute copies of Student Sheet 1, and give the students time to read "Part One."
2. Challenge the students to find sounds around the classroom and to record their results on their Student Sheets.



- Divide the class into teams of two. (Make same-sex pairs now to avoid problems that could arise in Part Two.)
- Instruct each team to pick up a stethoscope and two paper towels moistened with disinfectant.
- After the teams have disinfected their stethoscope earpieces, let them search for sounds for about ten minutes.

3. Informally discuss the results after the exploration.

Practicing the Counting Procedure

1. Select a sounding board such as a wall, long table, counter top, or window sill.
 - Ask the students to line up along the sounding board.
2. Tell the students that you are going to tap on the board lightly with a stick or ruler.
 - While you tap, each student with a stethoscope should place the diaphragm on the surface of the board, close his eyes, and count your taps.
3. Start tapping.
 - Conduct several tapping sequences in which you tap twenty to thirty times at regular intervals (tap, tap, tap . . .).
 - For at least one sequence, tap very lightly so that the students will learn to listen carefully for weak sounds (such as a heart sound).
 - For the last few sequences, try to simulate a lub-dub pattern (tap-tap, pause, tap-tap, pause . . .), and ask the students to count each tap-tap as one beat.
 - Make sure to get student agreement on the tapping counts now, or difficulties will be compounded later.
4. Conduct a second counting session for the remaining students.
 - Remind them to disinfect the earpieces.

THE ACTIVITY: PART TWO

Introducing Part Two. Tell the students that they will now search for their partners' heartbeats by placing the stethoscope's diaphragm directly on the skin at different places on the body.



Finding Heartbeats

1. Have the partners trade Student Sheets.
2. Explain that each student should find the place on his partner's body where he hears the strongest heartbeat, and mark that spot on his partner's Student Sheet body outline.

3. Encourage the students to follow the "Part Two" instructions on Student Sheet 1.
4. Ask the students to describe the heart sounds they hear. ("Lub-dub" is a common description of this sound.)



Counting and Comparing Heartbeats

1. Tell the students that they will now determine their partners' heartbeat rates while the partners stand, sit, and lie down.
2. Describe the following procedure to the students.
 - Count the lub-dub sound as one heartbeat.
 - Wait at least one minute after your partner has changed positions before counting her heartbeats.
 - Count the heartbeats for thirty seconds in each position, and then multiply the count by 2 to find the number of beats per minute.
3. Give each of the students a copy of Student Sheet 2, and let them begin.
4. After the students have taken their counts, give them time to complete their Student Sheets.

Analyzing the Data

1. Ask several students to place orange dots on the human-body chart at the spots where they heard the loudest heart sounds. (Each student should place only one dot.)
 - If other students found strong heart sounds at other sites, have them place dots on those spots.
2. Offer these questions for discussion:
 - Do dots in different locations mean that the heart moves from place to place? What else could they indicate?
 - What sounds does a heart make?

- What happens to your heartbeat rate when you stand? Sit? Lie down? Why do you suppose these rates are different?

HEALTH APPLICATIONS

1. When a doctor listens to your heart or lungs, why do you suppose she moves the stethoscope around so much? Why wouldn't she talk to you during this examination?
2. Why do you think that checking your heartbeat rate regularly would be a good idea?
3. A person's resting heartbeat rate increased from 80 to 100 beats a minute over a two-year period. How could you find out if this were normal? (See the first HAP Sidetrip.)

HAP SIDETRIPS

1. Listen to the heartbeats of older people. Are their heartbeats rates higher or lower than yours?
2. How many times will a heart that is beating at 60 beats per minute beat in an hour? A day? A year? Ten years?
3. The heart is about the size of a fist and beats night and day. How long can you open and clench your fist at the same rate that your heart beats?
4. Find out how your heartbeat rate is affected by the time of day.
5. What is your heartbeat rate before, while, and after you eat?
6. What other body positions can you assume that affect your heartbeat rate?



Take-Home Idea. With your fingers, search for the heartbeat of a dog, cat, horse, or other tame animal. Where is the heart and how fast does it beat?



EXPLORING PULSE

HEART FITNESS AND ACTION Module



OVERVIEW

Each student locates her pulse points, takes her pulse, and compares her pulse rate to her heartbeat rate.

HEALTH BACKGROUND

Vital signs are indications of life. The four most common vital signs that professionals check are pulse strength and rate, breathing rate, temperature, and blood pressure. The pulse rate is one vital sign that the average person can monitor for irregularities without expensive equipment.

Each pulse is a swelling of an artery. The contraction part of the heartbeat cycle creates a surge of blood that flows through and swells the arteries. Each contraction pushes blood from the heart to the body cells, which need the blood's oxygen and food. There is no pulse as the blood flows back to the heart through the veins and other tissues.

Most arteries lie deep within muscles and are not accessible for pulse taking. In areas where there are no muscles, such as around joints or along the outside of the skull, the pulse can be detected because the arteries are closer to the skin.

A person's pulse rate may vary according to the body's need for oxygen or for removal of waste. Most children between the ages of eight to fifteen have pulse rates from 70 to 85 beats per minute. A child with a resting pulse rate below 60 or over 110 should be referred discreetly to the school nurse or a doctor to determine if his pulse is normal or symptomatic of a problem.

MATERIALS

For each team of four:

- 1 stethoscope
- 4 copies of Student Sheet EP*

For the class:

- 1 HAP clock
- 1 C-cell battery
- 1 Disinfectant Kit
- 1 human-body chart
- 1 "Our Pulse Rates" chart
- 6 blue dots
- 30 red dots
- 3 eraseable crayons (any color)
- 1 "Disinfecting the Equipment" Technique Card
- 1 duplicator master of Student Sheet EP

*Provided by the teacher.

SETTING UP

Suggested Time:

- Plan for 30 to 40 minutes for Part One.
- Plan for 30 to 40 minutes for Part Two.

Preparing for the Activity

1. Set up a Wiping Station according to the directions on the "Disinfecting the Equipment" Technique Card.
2. Make sure the C-cell battery is in the clock. Set the clock in full view of the students.
3. Post the two charts.
4. Set up a distribution station at which the rest of the equipment is available for the students.
5. Duplicate the Student Sheet.

THE ACTIVITY: PART ONE

Introducing the Activity. Do not explain the relationship between heartbeats and pulse at this time!

1. Introduce **pulse** as a periodic swelling of the blood vessels, which carry blood from the heart to the rest of the body.
2. Tell the students that this pulse occurs at regular intervals and can be felt through the skin.
3. Ask the students to comment on pulse.
 - Who knows about it?
 - Have you felt it?
 - What does it feel like?
4. Invite six students to each place a blue dot on the body chart at a place where they predict they could feel the pulse.



Locating the Pulse

1. Challenge the students to find their pulse at various places on their bodies.
2. Tell the students to use the eraseable crayons to mark these pulse points on the body chart. The crayon dots should be the same size as the blue dots.



Name _____

Exploring Pulse
Student Sheet EP

TAKING YOUR PULSE

- Find your pulse at your wrist.
 - Make sure that you can find it whenever you want to.
- Now, count the number of pulses you feel in exactly 30 seconds.
- Take this count three different times, and record your counts in the table below.
- Multiply each count by 2 to find the number of pulse beats per minute.



TRIAL NUMBER	NUMBER OF PULSES IN 30 SECONDS	x 2	= NUMBER OF PULSES PER MINUTE
1.		x 2	=
2.		x 2	=
3.		x 2	=

AVERAGE NUMBER OF PULSES PER MINUTE

TOTAL

=

+ 3

=

- Find your average pulse rate by adding the three number in the "Number of Pulses Per Minute" column and then dividing the total by three.



3. Let the students search for pulse points.
4. After the students have completed their search, ask them:
 - How did the six students' predictions compare with your results?
 - How were the parts of your body where you found pulse points different from parts of your body where you could find no pulse?

PULSE POINTS	NON PULSE POINTS
WRIST	ARM
TEMPLE	TOP OF SKULL
THROAT	MID THIGH
TOP OF FOOT	
BEHIND EAR	

Counting Pulses

1. Explain to the students that now they will take their pulse counts.
2. Show the students how to take their pulse at the wrist.
 - Arch the first three fingers of one hand and place the finger tips on your other wrist between the center of the wrist and the bone on the thumb side.



3. Explain to the students that they will now count their pulses for 30 seconds and then multiply the resulting count by 2 to find their pulse rates (number of pulses per minute). Point out the HAP clock to the students.
4. Give each of the students a Student Sheet and let them begin.
 - Remind them to make three counts.

5. Circulate through the class, and assist those who are having difficulty or who are recording 30-second counts below 30 or over 55.

- Allow sufficient time for the students to master pulse counting.
- Let them check each other's pulse.
- Remind the students to average their three pulse rates.

Graphing the Results

1. Show the students how to use the "Our Pulse Rates" chart to record their data from the Student Sheets.
 - Select a student to place the first red dot at the intersection of the 1-student line and the vertical line closest to her average pulse rate.
 - Select another student whose pulse rate would fall on the same line, and show him how to position his dot at the next higher intersection (at the 2-students line and the same pulse-beats-per-minute line).
2. Remind each student to post only one dot, which represents his *average* pulse rate.

Analyzing the Data. After the students have posted their dots, the chart will illustrate the distribution of individual pulse rates in that class.

1. Encourage the students to discuss the results, in terms of *range* (the difference or area between the highest and lowest rates, e.g. 72 to 80) and *average*.
2. Explain that the average gives one value that represents all the pulse rates found in that class.
 - The average is not necessarily the only *normal* pulse.
 - Normal pulse rates for individuals vary over a wide range.

THE ACTIVITY: PART TWO

Introducing Part Two. Initiate a discussion about the relationship between the pulse and the heartbeat rate.

1. Invite the students to propose an experiment to find out if pulse and heartbeat rate are related.

2. Let the youngsters follow through on their experimental design or, if necessary, use the following plan designed for teams of four students.

- One student acts as the SUBJECT.
- The second student uses the stethoscope to listen to and count the SUBJECT's heartbeats for 30 seconds.
- The other two students take the SUBJECT's pulse — one at the SUBJECT's right wrist and the other at the left wrist.
- Each team collects three 30-second counts and records the results on the back of a Student Sheet. (Team members may switch roles if they wish. The SUBJECT does not have to be the same for all three trials. The purpose of this exercise is to establish the relationship between pulse and heartbeats, not to make a specific measurement.)



Comparing Pulse and Heartbeat Rates

1. Divide the class into teams of four, and give each team a stethoscope.
2. Let the teams begin, using either their own plan or the one suggested.
3. Visit the groups and assist those who are getting heartbeat and pulse rates that differ by more than 2 or 3 beats (or pulses) for each 30-second count.
 - Small deviations are usually due to counting errors, especially at the beginning of the count.

Analyzing the Data. Display the results on the chalkboard in the following manner.

Left Wrist	Heart	Right Wrist
36	38	38
42	42	42

1. Encourage analysis of the data with such questions as:

- How close are the numbers in one counting session?
- Could differences be due to counting errors?

2. You may wish to enlarge upon the students' understanding of this relationship by explaining why the pulses and heartbeats come together.

HEALTH APPLICATIONS

Your friend has just had a very bad fall, knocking her head on the concrete. She has fallen on her wrists, and you don't want to move her for fear of hurting her neck or back.

- How could you take her pulse?
- How will a pulse taken at some other point on the body compare to the wrist pulse?

HAP SIDETRIPS

1. Take your pulse at different times throughout the day. Take it right after you wake up, when you are in class, before and after lunch, and before a test.

- Is your pulse rate always the same?
- How could you explain any differences?

2. Learn your own pulse rate so well that you can sit quietly with your eyes closed and tell someone when one minute is up. (If you fold one hand over your wrist in your lap, no one outside of this HAP class will know that you are taking your pulse.)

3. Compare pulse rates of active and inactive people, smokers and non-smokers, boys and girls, etc.



Take-Home Idea. Find the pulse points on your dog or cat, and take its pulse. How does its pulse compare to your pulse? How do the pulse points compare to yours?



PULSE RECOVERY

HEART FITNESS AND ACTION Module



OVERVIEW

The students monitor the recovery of their pulse rates from their after-exercise rates to their normal resting rates.

HEALTH BACKGROUND

When you exercise, you use more energy than when you are inactive. When you use more energy, your pulse rate (which is the same as your heartbeat rate) increases, sending more blood per minute throughout the body to replenish the muscles' store of nutrients and oxygen and to remove the additional waste

products created. Your pulse returns to normal only after the blood's waste levels have returned to those of the resting state.

A rapid recovery time usually means that you can exercise or work longer without stopping, can exercise again much sooner, and will not be as short of breath as people with slow recovery times.

Doctors diagnosing heart conditions often look at patients' after-exercise recovery patterns. The speed with which the pulse rate returns to normal is an excellent indicator of fitness. Once determined, this rate of recovery may be used as a personal standard that students can use to evaluate their level of conditioning in the future.

MATERIALS

For each student:

- 1 copy of each Student Sheet: PR 1*, PR 2*, and PR 3*

For the class:

- 1 HAP clock
- 1 C-cell battery
- duplicator masters of Student Sheets PR 1, PR 2, and PR 3

*Provided by the teacher.

SETTING UP

Suggested Time: Conduct this activity after your class has completed *Exploring Pulse*.

- Plan for 40 to 50 minutes for Part One.
- Plan for 40 to 50 minutes for Part Two.
- Plan for 20 to 30 minutes for Part Three.

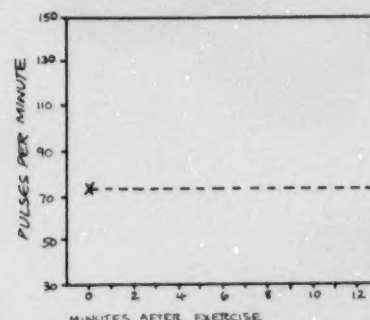
Preparing for the Activity

1. Find two objects that are 50 to 100 meters apart to serve as markers around which the students can run. Basketball support posts on playgrounds are ideal.
2. Draw the axes of a graph on the chalkboard, and fill in the two scales as shown in the illustration.
3. Duplicate the Student Sheets.

THE ACTIVITY: PART ONE

Introducing the Activity. Tell the students that they are going to raise their pulse rates by exercising and then find out how long their pulse rates take to recover from the after-exercise rate to the resting rate.

1. Ask one student to estimate her average resting pulse and to mark an X on the vertical axis of the graph you have drawn on the chalkboard.
 - From that X, draw a broken horizontal chalk line to the right edge of the graph.



- Explain that this line represents her resting pulse rate.

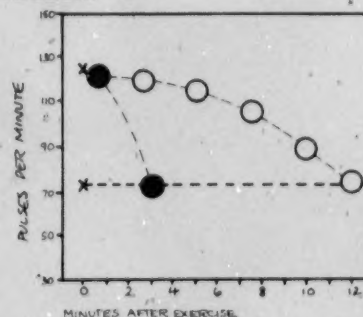
2. Suggest that running will increase her pulse rate and, as an example, place an X at the intersection of 125 pulses per minute and 0 minutes after running. Ask the students:

- What do you think the pulse will be after one minute of rest? (Make a dot at that point.)
- When do you think the pulse will return to its resting rate? (If they were to answer "in the third minute," you would put a chalk dot on the resting-rate line, directly above the 3-minute mark.)

3. Connect the X and the two dots with a curved line as shown in the illustration.

4. Tell the students that a steep line represents a short recovery time and, generally, good physical conditioning. A more gentle line represents a long recovery time.

- On your chalk graph, draw another line such as the one from 125 pulses per minute through the circles, as shown in the illustration.



- Tell the class that this line represents a long recovery time and ordinarily indicates poor physical condition.
- Encourage the students to discuss this graph and what they think their completed graphs will tell them.

Name _____

PRACTICING THE COUNT-AND-RECORD PROCEDURE

PART ONE: RESTING PULSE RATE

1. At your teacher's signal, count and record your resting pulse three times.
2. Multiply your fifteen-second counts by 4 to get pulses per minute (last column).
3. Divide the total by 3 to find your average rate.

TRIAL NUMBER	PULSES PER 15 SECONDS	$\times 4$	PULSES PER MINUTE
1		$\times 4 =$	
2		$\times 4 =$	
3		$\times 4 =$	
TOTAL			
Divide by 3			$\div 3$
AVERAGE RESTING RATE			

PART TWO: PULSE RATE AFTER EXERCISE

1. Jump for one minute.
2. Stop.
3. Sit and get ready for your teacher to say: "Ready, Ready, Count."
4. At the "Count" signal, count your pulse for 15 seconds.
5. When your teacher says "Stop and record," record that count in the box next to 0.0.
6. Find your pulse again.
7. Listen for your teacher to say "Count" again.
8. Count your pulse for 15 seconds.
9. Record that count in the box next to 0.5.
10. If you miss a count, skip that box and wait for your teacher's next "Count" signal.
11. Keep doing this until your teacher stops saying "Count."

MINUTES AFTER EXERCISE	PULSES PER 15 SECONDS	$\times 4$	PULSES PER MINUTE
0.0		$\times 4 =$	
0.5		$\times 4 =$	
1.0		$\times 4 =$	
1.5		$\times 4 =$	
2.0		$\times 4 =$	
2.5		$\times 4 =$	
3.0		$\times 4 =$	
3.5		$\times 4 =$	
4.0		$\times 4 =$	
4.5		$\times 4 =$	
5.0		$\times 4 =$	



Name _____

MONITORING YOUR PULSE RATE AFTER EXERCISE

PART ONE: RESTING RATE

My resting rate today is _____ pulses per minute.

PART TWO: PULSE RECOVERY TIME

1. After running, sit down and get ready for your teacher's signal.
2. When your teacher says "Count," take your pulse for 15 seconds.
3. When your teacher says "Stop and record," record your count in the box next to 0.0.
4. Find your pulse again.
5. Listen for your teacher to say "Count."
6. Repeat the counting and recording procedure.
7. Keep doing this for 15 minutes even if your pulse reaches your resting rate.
8. If you miss a count, skip that box and wait for your teacher's next "Count" signal.

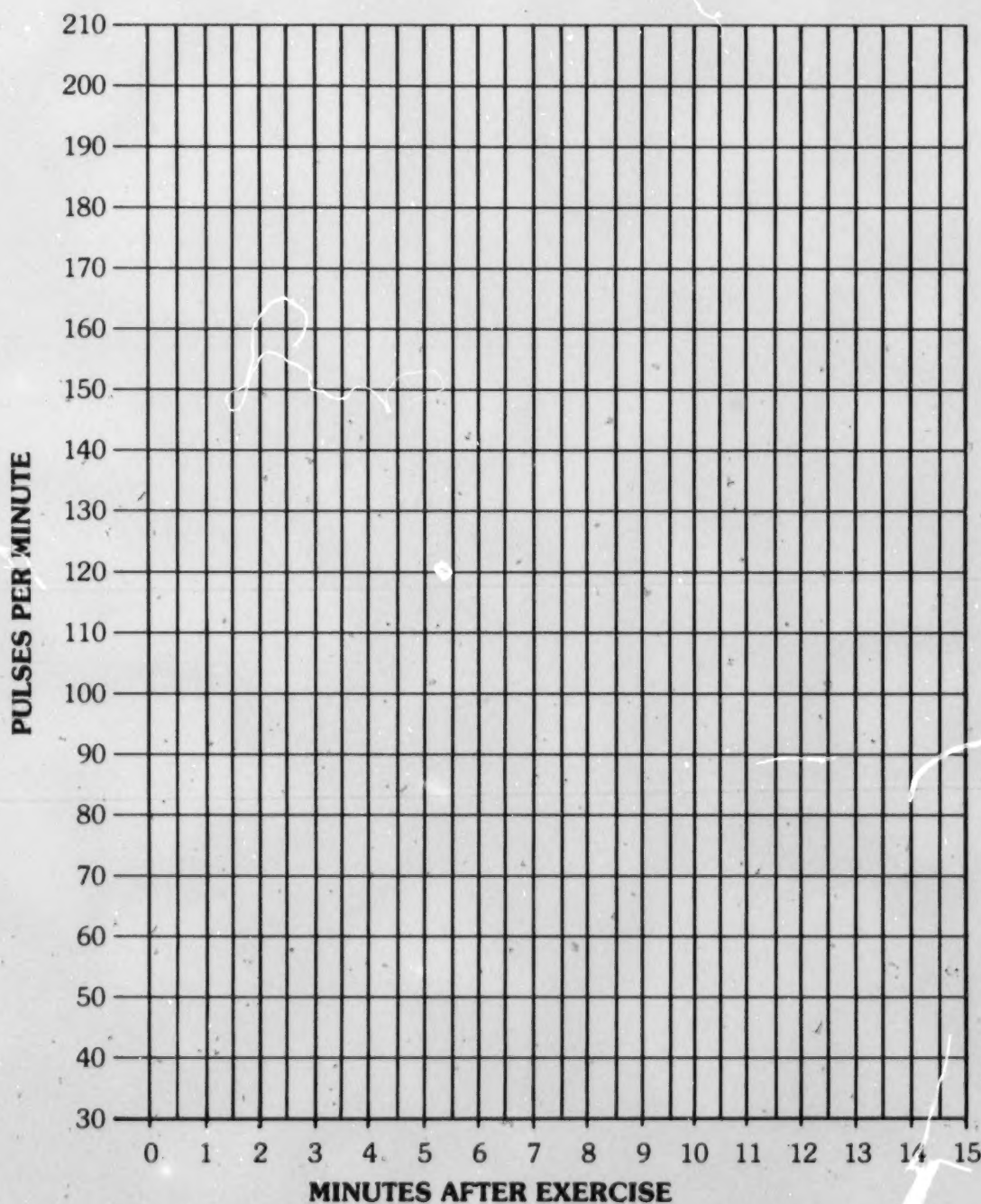


MINUTES AFTER EXERCISE	PULSES PER 15 SECONDS	× 4 =	PULSES PER MINUTE
0.0		× 4 =	
0.5		× 4 =	
1.0		× 4 =	
1.5		× 4 =	
2.0		× 4 =	
2.5		× 4 =	
3.0		× 4 =	
3.5		× 4 =	
4.0		× 4 =	
4.5		× 4 =	
5.0		× 4 =	
5.5		× 4 =	
6.0		× 4 =	
6.5		× 4 =	
7.0		× 4 =	
7.5		× 4 =	
8.0		× 4 =	
8.5		× 4 =	
9.0		× 4 =	
9.5		× 4 =	
10.0		× 4 =	
10.5		× 4 =	
11.0		× 4 =	
11.5		× 4 =	
12.0		× 4 =	
12.5		× 4 =	
13.0		× 4 =	
13.5		× 4 =	
14.0		× 4 =	
14.5		× 4 =	
15.0		× 4 =	



Name _____

GRAPHING YOUR PULSE RECOVERY



5. If your students are not familiar with graphs, you may want to give them some more examples.

Introducing the Counting and Recording Procedure

1. Give each of the students a copy of Student Sheet 1, and let them read it.
2. Explain that the counting and recording sessions will go quickly and that you won't be stopping for anyone who loses track of his pulse or where to record.
3. Tell the students that they are now going to practice counting and recording.

Practicing the Pulse-Counting Procedure

1. This preliminary trial will give you practice in clocking the event as well as giving the students practice in keeping up with the count. The students should use Student Sheet 1 for recording the results of this trial.
 - With everyone rested and sitting, say "Ready," pause, "Ready," pause, "Count." Time your words so that when you say "Count," the clock's second hand is at zero seconds (or at one of the other quarter marks) to make timing easy.
 - At exactly 15 seconds, say "Stop and record," and *keep your eyes on the clock*.
 - Ten seconds later, start your "Ready, Ready, Count" routine; the word "Count" then coincides with the second hand's arrival at the 30-second mark.
 - A sample scheme for a one-minute period is illustrated.



Sample Counting Scheme

2. Have the students record three resting pulse rates in this fashion.
 - Those students whose counts differ by more than 3 are probably making an error in starting or counting. Help those needing assistance.
3. For practice in the after-exercise procedure, have everyone jump up and down in place for

one minute, sit down, and then record their pulse rates as described on the Student Sheet. Immediately start the counting procedure and continue clocking for four or five minutes.

4. Encourage the students to share their resting and after-exercise pulse rates with the class.

THE ACTIVITY: PART TWO

Introducing Part Two

1. Tell the students that they are now going to monitor their pulse recovery.
2. Give each student a copy of Student Sheet 2.

 **Establishing the Resting Rate.** Tell the students that they must first establish their resting rates.

1. With the students sitting down, lead them in a one-minute count of their pulse rates.
2. Have the students record their resting rates on their Student Sheets.

Preparing for the Run

1. Take the clock and the students out to the running area. Make sure that everyone is ready.
 - Each student should have a copy of Student Sheet 2 (folded into quarters for easy carrying and recording) and a pencil.
 - Have the students set their pencils down at the place you plan to have them stop and record.
 - You should be able to see the HAP clock.
2. Tell the students that everyone will run the same distance at the same speed. Remind the students:
 - The counting will start as soon as you stop running.
 - Get settled quickly — there will be no waiting for stragglers.
 - If you miss a count, skip that one and get ready for the next count.
 - Continue counting your pulse for the full 15 minutes, even if your rate returns to normal.

Exercising and Monitoring the Pulse Rate

1. Either lead the run yourself or select a student to pace the group (at a speed slightly faster than jogging).

- Have the students run around the two markers until every student is breathing hard, usually about two minutes.
2. Let the pacer begin!
 3. When the students are breathing hard, tell them to sit down.
 4. Start the count within 15 seconds.
 - Waiting for stragglers destroys the data for everyone else, so don't wait!
 5. After 15 minutes (30 recordings), return to the classroom.

THE ACTIVITY: PART THREE

Graphing the Data

1. Have the students convert their counts to one-minute counts by multiplying each 15-second count by 4.
2. Give each student a copy of Student Sheet 3.
 - Tell the class that each student should plot his resting pulse rate on the graph by drawing a horizontal line across the graph at his resting rate.
 - Ask the students to graph the data they have just obtained.
 - Assist students who need help.

Analyzing the Data

1. Ask the students:
 - Whose pulse increased the most? The least?
 - How many of your pulse rates did not reach your resting rate in 15 minutes?
 - Did your pulse rate go below your resting rate? (Explain that this is a normal overreaction of the body.)
 - How do you think breathing rates are related to pulse rates? (They usually go up and down together.)
2. Encourage the students to compare their graphs by laying one over another and holding them up to the light.

Note: Although pulse recovery time is usually an indicator of the state of fitness, other factors (such as lack of sleep or nervousness) can affect specific measurements.

HEALTH APPLICATIONS

1. You decide now to keep a year-long record of your recovery time. You run four blocks every month or two to see if your recovery rate speeds up or slows down. Each time your pulse recovers a little slower than it did before.
 - What kinds of things might be slowing your recovery time?
2. Your father usually recovers from climbing the apartment stairs, mowing the lawn, or running in about three minutes. You notice now that he is taking close to six minutes to recover from the same amount of work.
 - What could be some causes?
 - What would you suggest your father do?

HAP SIDETRIPS

1. Find out how running a longer distance than the one you ran in this activity affects your pulse recovery time.
2. Run the same distance in a shorter time. What happens to your recovery time?
3. Run your dog and measure its recovery time. Can you reduce your dog's recovery time by exercising it every day?
4. Find some adults who you think are in good physical condition and some who you think are not. Give them your test and make a graph for each of them.



Take-Home Idea. Lead your family on a run and have them monitor their pulse recovery times.



SHAPE UP

HEART FITNESS AND ACTION Module



OVERVIEW

The students discover that they can reduce their pulse recovery times by training.

HEALTH BACKGROUND

The importance of physical activity to health has been demonstrated by medical researchers. The benefits from a regular exercise program include lower probability of heart disease, higher energy levels, better sleep patterns, weight control, fewer problems with digestion and elimination, an improved self-concept, and a feeling of well being. In addition, regular exercise strengthens muscles and improves the ability of the heart, circulatory system, and lungs to meet the heavy

demands that are sometimes placed on the body.

In order for a muscle to increase in strength, it must be stressed by working harder than usual. This phenomenon, called the *overload principle*, involves increasing one or all of the following:

- Frequency of Exercise (exercising more often).
- Duration of Exercise (exercising longer).
- Intensity of Exercise (lifting a heavier load or walking or running faster).

This activity gives the students the opportunity to improve their general physical condition and to measure their progress using the technique they learned in *Pulse Recovery*.

MATERIALS

For each student:

2 copies of Student Sheet SU 1*

1 copy of each Student Sheet: SU 2* and SU 3*

For the class:

1 HAP clock

1 C-cell battery

duplicator masters of Student Sheets SU 1, SU 2, and SU 3

*Provided by the teacher.

SETTING UP

Suggested Time: Conduct this activity after the students have completed *Pulse Recovery*.

- Plan for 45 minutes for Part One.
- Plan for 10 to 15 minutes on each of five consecutive days for Part Two.
- Plan for 45 minutes for Part Three.

Preparing for the Activity

1. An outdoor site is best for this activity, but you may use a gym, multipurpose room, or hallway. Use the classroom only as a last resort.
2. Find out if any children have medical problems that would preclude regular exercise.
3. Insert the C-cell battery into the HAP clock.
4. Duplicate the Student Sheets.

THE ACTIVITY: PART ONE

Introducing the Activity

1. Explain to the students that many people are concerned about the general level of physical fitness today. The concern is that too much sitting around is making people soft and flabby. Ask the students:

- Could you carry an injured friend or run a long distance in an emergency?
- Can you tell us about anyone you know who has had a heart attack related to poor conditioning or who has just "let himself go"?

- Even though everyone need not be a super athlete, what are some minimum tasks (or exercises) that could be used to find out what kind of shape your heart, lungs, and blood vessels are in?

2. Remind the class that measuring pulse recovery is an easy way to monitor their physical condition.

3. Tell the students that they are going to conduct a training program to find out if they can reduce their pulse recovery times.

Designing a Test

1. Tell the students that first they are going to design a test that they can use to compare their before-training and after-training pulse recovery times.

2. Ask the students to use some of the exercises they have just suggested to design the test. Ask them to follow these guidelines:

- Use your legs. With more muscles in the lower half of your body than in the upper half, you can get more exercise by working your legs.
- Don't make the test too difficult. Marathons and other heroic acts can hurt or at least discourage people who aren't in good shape.

3. Tell the students that they may plan a combination of exercises, such as 20 hops on each foot, 50 jumping jacks, and running in place, instead of a single exercise such as jogging.

- Whatever exercise they plan should produce heavy breathing and raise their pulse rates to about 120 pulses per minute.

4. Write the agreed-upon test on the chalkboard as it is developed.

- Let some students test the plan to make sure that it raises their pulse rates to 120 pulses per minute.
- Keep a record of the test, as it will be used for determining the after-training recovery times.

Establishing the Resting Rate. Remind the students that before they can determine their recovery times, they must establish their resting rates.

Name _____

MONITORING YOUR PULSE RECOVERY

PART ONE: RESTING PULSE RATE

1. Sit down.
2. At your teacher's signal, count and record your resting pulse three times.
3. Multiply your fifteen-second counts by 4 to get pulses per minute (last column).
4. Divide the total by 3 to find your average rate.

TRIAL NUMBER	PULSES PER 15 SECONDS	$\times 4$	PULSES PER MINUTE
1		$\times 4 =$	
2		$\times 4 =$	
3		$\times 4 =$	
		TOTAL	
		Divide by 3	$\div 3$
		AVERAGE RESTING RATE	

PART TWO: PULSE RECOVERY TIME

1. After exercising, sit and get ready for your teacher to say: "Ready, Ready, Count."
2. At the "Count" signal, count your pulse for 15 seconds.
3. When your teacher says "Stop and record," record that count in the box next to 0.0.
4. Find your pulse again, and get ready to repeat the procedure.
5. Keep doing this for 15 minutes even if your pulse reaches your resting rate.
6. If you miss a count, skip that box and wait for your teacher's next "Count" signal.

BEFORE AFTER

(Circle one.)

MINUTES AFTER EXERCISE	PULSES PER 15 SECONDS	$\times 4$	PULSES PER MINUTE
0.0		$\times 4 =$	
0.5		$\times 4 =$	
1.0		$\times 4 =$	
1.5		$\times 4 =$	
2.0		$\times 4 =$	
2.5		$\times 4 =$	
3.0		$\times 4 =$	
3.5		$\times 4 =$	
4.0		$\times 4 =$	
4.5		$\times 4 =$	
5.0		$\times 4 =$	
5.5		$\times 4 =$	
6.0		$\times 4 =$	
6.5		$\times 4 =$	
7.0		$\times 4 =$	
7.5		$\times 4 =$	
8.0		$\times 4 =$	
8.5		$\times 4 =$	
9.0		$\times 4 =$	
9.5		$\times 4 =$	
10.0		$\times 4 =$	
10.5		$\times 4 =$	
11.0		$\times 4 =$	
11.5		$\times 4 =$	
12.0		$\times 4 =$	
12.5		$\times 4 =$	
13.0		$\times 4 =$	
13.5		$\times 4 =$	
14.0		$\times 4 =$	
14.5		$\times 4 =$	
15.0		$\times 4 =$	



Name _____

DESIGNING YOUR TRAINING PLAN

1. My plan to "shape up" is to:

- exercise _____ times a day.
(one, two, three)
- exercise _____ day.
(every, every other)
- increase my _____ a little each day.
(speed, time, effort)

2. The exercise I will do is _____
(jog, jumping jacks, other — describe)

3. I will raise my pulse rate to _____ pulses per minute.
(120, 125, 130, 135)

4. I will exercise _____
(when and where)

5. I expect to lower my recovery time to _____ minutes.



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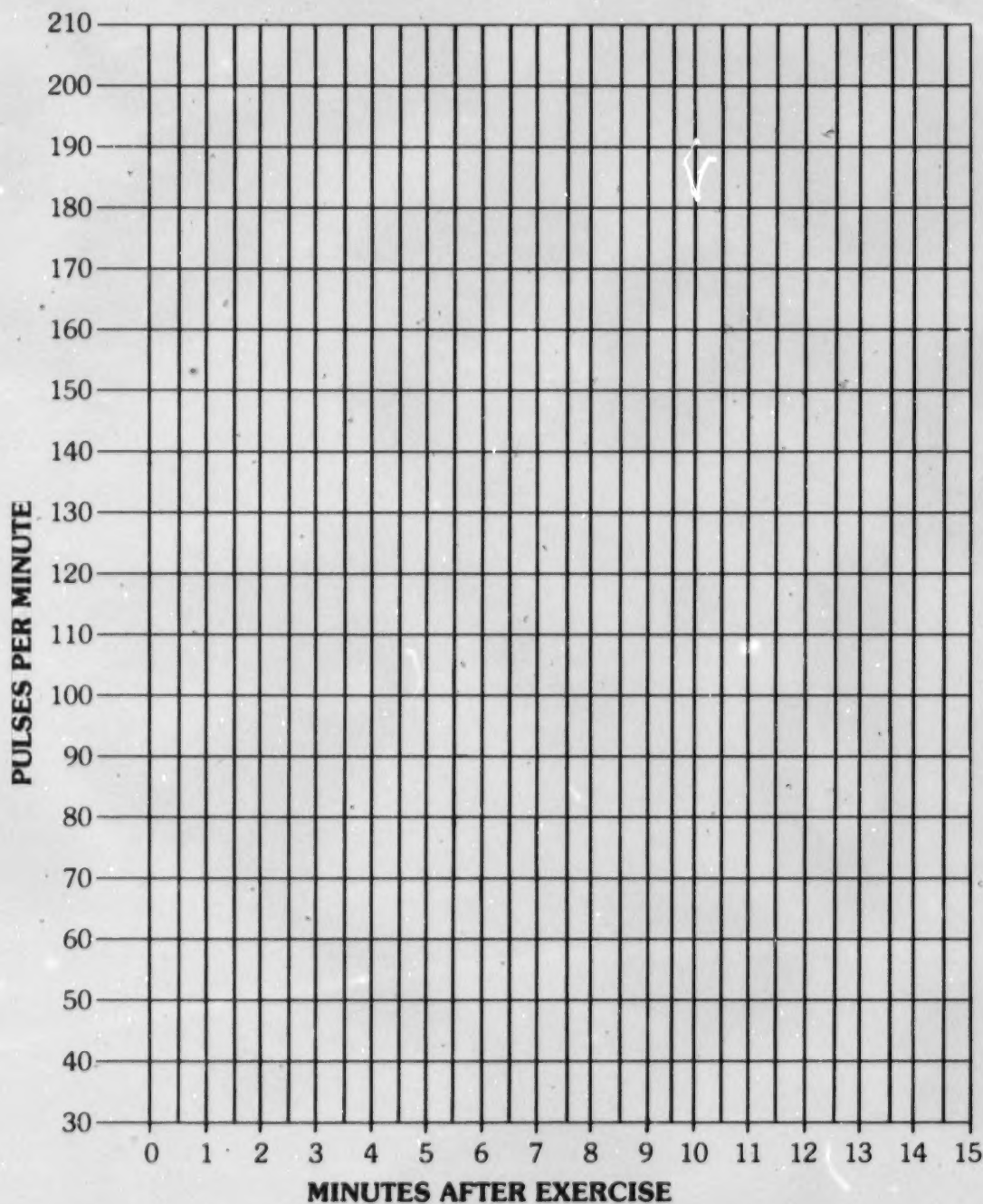
HEALTH ACTIVITIES PROJECT



Name _____

Shape Up
Student Sheet SU 3

GRAPHING YOUR "BEFORE" AND "AFTER" PULSE RECOVERY



1. Draw a horizontal line across the chart at your resting rate (today's rate).
2. Plot your before-training data with X's.
3. Plot your after-training data with ●'s.

4. Record your results here.

- Before-training recovery time = _____ minutes
- After-training recovery time = _____ minutes

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1. Give each of the students one copy of Student Sheet 1. Ask them to fold their sheets into quarters for easy carrying and recording.
2. Make sure that everyone is seated, and review the pulse-recovery-monitoring technique (from *Pulse Recovery*), if necessary.
3. Lead the students in three 15-second pulse-taking sessions.
 - Have them record their three counts on their Student Sheets.
 - Give them time to figure out their pulses-per-minute rates and then average their three rates.

Determining the Before-Training Pulse Recovery Time

1. Follow the test procedure developed by the youngsters.
 - Make sure that everyone starts and stops exercising at the same time.
2. After the students exercise, have them sit down immediately and monitor their pulse recovery for fifteen minutes.
3. Tell the students that they now have a measure (their pulse recovery times) of their own fitness as of this day.
 - Collect the Student Sheets and save them for Part Three.
 - Tell the students that they will repeat this test after they complete their training programs to find out if their recovery times have changed.

THE ACTIVITY: PART TWO

Introducing Part Two

1. Explain to the students that over the next week they should exercise to find out if they can "shape up" and reduce their recovery times.
 - Tell them that all data will remain confidential unless they want to share.
 - The emphasis will be on percent improvement, not on who can achieve the fastest recovery time.
2. Introduce the **overload principle** to the class.

- Explain that they want to do a little more each day so that the muscles and the circulatory system can handle more and more.

Planning Individual Training Programs

1. Encourage the students to plan their own individual exercise programs. (They may use the class procedure if they wish.)
2. Tell the students to make sure that their programs incorporate the following points:
 - Raise your pulse rate to 120 pulses per minute during exercise.
 - Gradually increase your exercise by exercising faster, longer, or with more effort.
 - Exercise daily.
3. Give each student a copy of Student Sheet 2, and let the students plan their own programs.

Training to Reduce Recovery Rates

1. Set aside ten or fifteen minutes on each of five days for the students to conduct their training. Encourage the students not to limit their training to the time you provide in class. (If you can't spare the class time, find out if the students' P.E. teachers can set aside 10 to 15 minutes each day for the students to conduct their training programs.)
2. Remind the students that you will hold another pulse-recovery test in a week to find out if they have improved.

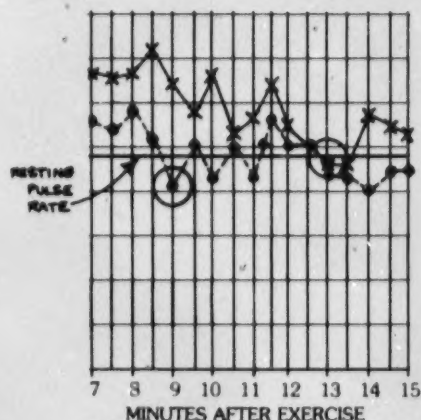
THE ACTIVITY: PART THREE

 **Determining Improvement.** After a week of training, repeat the pulse-recovery test designed by the students.

1. First, let the students establish their resting rates.
 - Make sure that the students are seated.
 - Give each student another copy of Student Sheet 1.
 - Lead the students in three 15-second counting sessions.
 - Give the students time to figure out their average resting rates.
2. Repeat the test and the pulse-monitoring procedure to obtain the after-training pulse recovery rate.

Analyzing the Results

1. Distribute copies of Student Sheet 3, and return the students' original copies of Student Sheet 1.
2. Review with the students how to graph their before-training and after-training data on the same graph. Ask the students to:
 - Plot your resting pulse rate (the one you obtained today) on the graph by drawing a horizontal line across the graph at your resting rate.
 - Plot your "Before" rates with X's and your "After" rates with dots.
 - Make one line connecting the X's and another line connecting the dots.
 - Label the two graph lines "Before" and "After."



3. Ask everyone to find the first time that their "Before" line remains on or below their resting-rate lines for two points in a row. Ask them to:
 - Mark the first of these two X's with a circle.
 - Do the same for your "After" line.
4. Ask the students: "How many of you recovered sooner after training? At the same time? Later?"
 - Make a chart on the chalkboard and record these numbers.

- If any students did not train, collect the same information for them, and add that to your chalkboard chart.
5. Show the children how to figure their improvement.
 - They have two circles on or below their resting pulse line. (Refer to the illustration.)
 - If they recovered faster after training, they should subtract the "After" minutes (9 on the example) from the "Before" minutes (13) to get the difference (4).
 - Such a student would have improved her recovery time by 4 minutes, or 4 (difference) $\times$ 100 $\div$ 13 (before-training time) = 31%.

Analyzing the Results. Ask the students:

1. What do your results tell you about the effect of regular exercise on your pulse recovery time?
2. Did your daily training get easier or harder for you as you did more? Why do you suppose that happened?

HEALTH APPLICATIONS

A week is a very short time to "shape up." How long do you think it would take for someone your age to get in shape? How long do you think it would take your parents? Why do you think so?

HAP SIDETRIPS

Continue your exercise plan and find out how much you can reduce your pulse recovery time.



Take-Home Idea. Plan an exercise program for your family and show them how they can improve their pulse recovery times.



GRIP STRENGTH

HEART FITNESS AND ACTION Module



OVERVIEW

After determining their grip strengths in each of their hands, the students find out if practicing for one week improves grip strength.

HEALTH BACKGROUND

The body requires a certain degree of muscle strength just for daily functions such as standing, sitting, and walking. To meet extra demands, such as lifting heavy objects and running, the body needs additional strength. Muscles develop strength by working harder than they normally do. As the students learn to measure and

increase their muscle strength, they should be able to see the connection between exercise and expanding the body's physical limits.

The muscles used for gripping objects are located in the lower arm. These muscles manipulate the fingers through an extensive set of tendons that run to the fingers and thumb. The strength of a person's grip is often different for each hand and may vary with use or disuse. Grip strength in the non-preferred hand can usually be increased more rapidly than the strength of the preferred hand because the non-preferred hand generally gets less exercise, thus leaving more room for improvement.

In this activity, the students again find that they can take charge of their bodies and change them for the better.

MATERIALS

For each team of three:

- 1 grip tester
- 1 rubber gripper
- 3 copies of Student Sheet GS*

For the class:

- 1 "Grip Strength" chart
- 60 green dots
- 60 orange dots
- 1 erasable crayon
- 1 "Averaging the Data" Technique Card
- duplicator master of Student Sheet GS

*Provided by the teacher.

SETTING UP

Suggested Time:

- Plan for 40 minutes for Part One.
- Plan for 10 minutes on each of five days for Part Two.
- Plan for 40 minutes for Part Three.

Preparing for the Activity

1. Prepare each grip tester.
 - Stand the back of the gauge up, and fit it into the round base.
 - Let the bulb hang straight down, and squeeze it several times until no more bubbles appear in the liquid.
 - On the colored dot near the top of the gauge, mark each grip tester with a different letter so that each student can use the same device for all his trials.
2. Post the "Grip Strength" chart.
 - Place a green dot below each "Before Exercise" column and an orange dot below each "After Exercise" column.
3. Duplicate the Student Sheet.
4. Set all the materials (except for the orange dots and the rubber grippers) at a distribution station.

THE ACTIVITY: PART ONE

Introducing the Activity. Show the students the grip tester, and explain that it will help them measure grip strength.

1. Point out the scale marked off in units of force.
2. Show the students how the fluid level rises in the tube when you squeeze the bulb.

Organizing the Class

1. Explain to the students that they will compare the grip strengths of their preferred hands (the ones they use to lift an object or throw a ball) with the grip strengths of their non-preferred hands.
2. Explain the roles of the three team members:
 - The SUBJECT squeezes the bulb.
 - The OBSERVER reads the highest level the fluid in the gauge reaches with each squeeze.
 - The RECORDER writes this value on the SUBJECT's Student Sheet.
3. Point out the four different columns on the chart. Explain to the students that today they will measure their grip strengths and record their scores in the two "Before" columns. Instruct the students:
 - Note the letter at the top of your tester so that you can always work with the same tester.
 - Make three measurements for each hand.
 - Average the three trials for each hand.
 - Use a green dot to mark on the chart your average grip strength for each hand.
 - Place your dots on the chart as soon as you complete your test. (This prevents traffic jams at the chart.)
 - If your measurement is the same as another student's, place your dot beside hers, with the edges touching.



Measuring Grip Strength

1. Have one member of each team pick up one grip tester, three Student Sheets, and six green dots.
2. Let the students measure and record their grip strengths.
 - As you visit each team, watch for the variety of squeezing styles so you can comment on some later.
 - Offer assistance to teams having trouble.

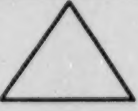
SUBJECT's Name _____

Student Sheet GS

TESTING YOUR GRIP STRENGTH

Letter on my grip tester _____

PART ONE: BEFORE EXERCISE

TRIAL NUMBER	PREFERRED HAND	NON-PREFERRED HAND
1	_____ units	_____ units
2	_____ units	_____ units
3	_____ units	_____ units
TOTAL	_____ units	_____ units
Divide by 3	+ 3	+ 3
AVERAGE	 units	 units

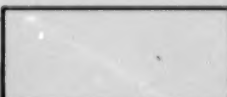
PART TWO: AFTER EXERCISE

TRIAL NUMBER	PREFERRED HAND	NON-PREFERRED HAND
1	_____ units	_____ units
2	_____ units	_____ units
3	_____ units	_____ units
TOTAL	_____ units	_____ units
Divide by 3	+ 3	+ 3
AVERAGE	 units	 units

PART THREE: ANALYZING THE RESULTS

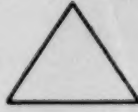
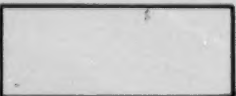
1. Subtract your "Before Exercise" results from your "After Exercise" results.

PREFERRED HAND:

 -  = 

number of units your grip strength increased in your preferred hand

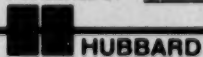
NON-PREFERRED HAND:

 -  = 

number of units your grip strength increased in your non-preferred hand.

2. Which hand improved the most? _____
3. Why do you suppose one hand improved more than the other? _____

PUBLISHED BY

**HUBBARD**

P.O. BOX 104, NORTHBROOK, ILLINOIS 60062 • 312/272-7810

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HEALTH ACTIVITIES PROJECT



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Analyzing the Data

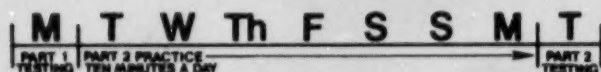
1. Average the two "Before Exercise" columns of the chart. (See the "Averaging the Data" Technique Card.) Use the erasable crayon to mark the average points.
2. Ask the students to compare and discuss the average strengths in their preferred and non-preferred hands.
3. Invite several students you observed using unique squeezing techniques to demonstrate their techniques.
4. Tell the students that they are going to find out if practicing can improve grip strength. Ask the students:
 - While you are practicing, should you change your squeezing technique?
 - What might happen to your "Before" and "After" comparisons if you also changed the way you gripped the bulb? (They would not know if a change was due to a change of grip technique or a change in strength.)
5. Collect the Student Sheets, and save them for Part Three.

Designing a Practice Plan

1. Show the students the rubber grippers, and let them know that these grippers are available for them to use.
2. Ask the students for suggestions on methods to use in improving their grip strengths. While they make suggestions, ask them to take into account the following questions:
 - How often should you practice squeezing?
 - How many times should you squeeze during each practice session?
 - Should you practice with both hands or just one?
 - How hard should you squeeze?

Note: Squeezing a gripper thirty consecutive times with each hand each day for five days will nearly always improve grip strength.

3. Have each student decide on a particular method of training.



SAMPLE TRAINING SCHEDULE

THE ACTIVITY: PART TWO



Training to Increase Grip Strength

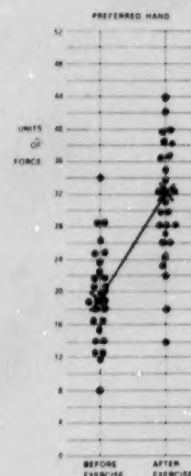
1. For the next five days, have the students conduct their three trials each day.
 - Either set aside a time when the whole class can run trials at once, or let the teams conduct their trials throughout the day.
2. Leave the rubber grippers and the grip testers out for the students to use.
 - The grip tester bulb may also be used as a practice gripper.
 - Let the students check out the rubber grippers for the weekend if you approve.

THE ACTIVITY: PART THREE



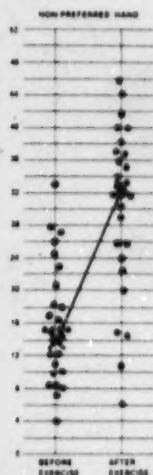
Measuring Improvement

1. One week later, let the students again measure their grip strengths in both hands.
 - Make sure they use the same testers they used during their first trials.
2. Have the students record their data on their original Student Sheets in the "After Exercise" table.
 - Make the orange dots available now for the students to use in plotting their averages in the two "After" columns on the chart.



3. Average the two "After Exercise" columns of the chart, and mark the average points. (See the "Averaging the Data" Technique Card.)

4. Use the eraseable crayon to connect the two preferred-hand average points. With another line, connect the non-preferred-hand average points.



Analyzing the Data

1. The graph can now be used to discuss the following:

- Change in the Strength of the Preferred Hand (Compare "Before Exercise" and "After Exercise" strengths of the preferred hand.)
- Change in the Strength of the Non-preferred Hand (Compare "Before" and "After" strengths of the non-preferred hand.)
- Most Improved Grip Strength (Compare the steepness of the two lines.)

2. Ask the students:

- How much of an improvement did you see?
- Did the weaker or stronger hand of last week show the greater improvement? Why do you suppose that happened?
- Why do you think some students showed greater improvement than others?
- What exercise plans produced the most improvement?

HEALTH APPLICATIONS

1. You have just been told about a good job at a canvas shop that requires a lot of squeezing to insert eyelets and rivets, but you are afraid you will not be able to do it all day.

- How could you prepare for the interview and the job?

2. Older people often suffer strokes, which temporarily prevent hand muscles from receiving a signal to work. The muscles usually become very weak and small from disuse.

- How could you help a stroke victim to recover the use of his hands after his nerves begin working again?

HAP SIDETRIPS

1. Finger Strength. Compare the strengths of your fingers by pressing the bulb between each finger and the thumb. Which finger is strongest?

2. Find out how hand exercise affects your pulse rate. Take your pulse for fifteen seconds, exercise with both hands for thirty seconds, and immediately check your pulse again.

3. Exercisers and Non-Exercisers. Divide the class into two groups. Half of you will be the "lazy hands" group (no exercise) and the other half will be the "exercising hands" group. For the next week, the lazy hands will discontinue hand-gripping exercises, while the exercising hands continue hand-gripping exercises. Then you should both re-measure your grip strength.



Open-House Night. Measure your parents' grip strengths when they visit your classroom.



DISINFECTING THE EQUIPMENT

Technique Card

Certain HAP activities feature materials that need disinfecting before they are reused by other students. In some activities there is enough equipment so that the materials may be soaked in the dilute bleach disinfectant

after the activity. In other situations, shared materials must be *wiped* with the disinfectant before the next student uses the materials. Each folio informs you as to which kind of disinfectant station, if any, you will need.

WIPING STATION

Materials:

1 pint of household bleach
1 bucket
paper towels*
water*

*Provided by the teacher.

What to do:

1. Make the dilute bleach disinfectant by adding 2 capfuls (1 tbsp.) of bleach to one gallon (4 liters) of water (preferably warm or hot) in a bucket.
2. Place the bucket and paper towels in an accessible classroom location.
3. During the activity, use a paper towel dipped in the solution to thoroughly wipe the parts of the equipment that contact the mouth, eyes, or skin.



SOAKING STATION

Materials:

1 scrub brush
1 pint of household bleach
1 pint of household detergent
1 bucket
water*
sink* (optional)
paper towels*

*Provided by the teacher.

What to do:

1. After the activity, collect the used equipment in the bucket, and take the bucket, bleach, detergent, and brush to the sink area. (If you don't have a sink, disinfect the equipment in the bucket.)
2. Use the brush to scrub the equipment pieces in a sink or the bucket full of soapy water.
3. Empty the water, and rinse the equipment.
4. Make the dilute bleach disinfectant in the bucket. (Use the same formula described in the "Wiping Station" section.)
5. Soak the equipment in the disinfectant for two to three minutes.
6. Dry the equipment and store it in clean plastic bags.

